In a further preferred variant, the compressor is contained within a sealed metal casing. Supply gas enters the interior volume of this casing through a check valve and is drawn into the compressor from the crank-portion of this interior volume. Also located within the casing is the motor, preferably a variable speed motor, and preferably control circuitry for delivering current to the motor. In these preferred scenarios, the motor is an alternating current induction motor, and in the variable speed situation the control circuitry produces an alternating current signal of varying frequency, whereby the speed of the motor is varied in accordance with system requirements.

It is a further preferred feature of the invention that not only is the electrical motor operating the compressor mechanism contained within the same casing as the compressor, but also the control circuitry for delivering power to the motor is contained within the casing. An advantageous result achieved by this arrangement is that electromagnetic emissions arising from current being delivered from the motor controller to the motor are confined within the metallic casing.

The control circuitry may deliver current at 360 volts DC provided through a sealed penetration of the casing wall. The motor control circuitry operates to create alternating current having a frequency of on the order 60 Hz but with multiple harmonics. The electrical power delivered to the motor provides current, at a typical maximum level, of on the order of 8 to 10 amps. The electromagnetic radiation from the wiring extending between the control

circuitry of the motor carrying a such current at such frequencies is a source of electromagnetic radiation. By confining this wiring to within the metallic casing, electromagnetic radiation from this source is shielded from entering into the environment.

On start-up, low motor speeds are preferably adopted to reduce otherwise high start-up current drains on the electrical supply system. This enables the unit to operate off of a standard household voltage, e.g. 110-120 volt, moderately fused electrical supply system. After start-up, initial compression can be effected with a high motor speed. Once higher pressures have been established in the motor vehicle fuel reservoir or other delivery receptacle, the motor speed is reduced in order to moderate ring wear and limit power consumption. This procedure is especially suited to oil-less compressors as the wear rate of the sealing rings within the compressor cylinders of such units increases when the compressor system is operated at high speed against a high-back pressure.

Furthermore in the case of use a continuously controllable, variable speed motor, the speed of the electric motor may also be controlled to avoid natural resonant frequencies arising from its mechanical components that would otherwise increase the noise and vibration generated by the unit.

The foregoing summarizes the principal features of the invention and some of its optional aspects. The invention may be further understood by the description of the preferred embodiments, in conjunction with the drawings, which now follow.

employed, are terminated. Thereafter the valve means is actuated to reconnect the outlet stage of the compressor to the delivery line. The compressor motor is then speeded up to resume the compression cycle if it has been slowed down, and the inlet to the supply line automatically reopens. Alternately, if a fixed speed motor is employed, the bypass lines is/are closed-off allowing the regular compression cycle to resume.

In a further preferred variant, the compressor is contained within a sealed metal casing. Supply gas enters the interior volume of this casing through a check valve and is drawn into the compressor from the crank-portion of this interior volume. Also located within the casing is the motor, preferably a variable speed motor, and preferably control circuitry for delivering current to the motor. In these preferred scenarios, the motor is an alternating current induction motor, and in the variable speed situation the control circuitry produces an alternating current of varying frequency, whereby the speed of the motor is varied in accordance with system requirements.

It is a further preferred feature of the invention that not only is the electrical motor operating the compressor mechanism contained within the same casing as the compressor, but also the control circuitry for delivering power to the motor is contained within the casing. An advantageous result achieved by this arrangement is that electromagnetic emissions arising from current being

delivered from the motor controller to the motor are confined within the metallic casing.

The control circuitry, which may deliver current at 360 volts DC to the motor, is itself provided with current through a sealed penetration of the casing wall. The motor control circuitry operates to create alternating current having a frequency of on the order 60 Hz but with multiple harmonics. The electrical power delivered to the motor provides current, at a typical maximum level, of on the order of 8 to 10 amps. The electromagnetic radiation from the wiring extending between the control circuitry of the motor carrying a such current at such frequencies is a source of electromagnetic radiation. By confining this wiring to within the metallic casing, electromagnetic radiation from this source is shielded from entering into the environment.

On start-up, low motor speeds are preferably adopted to reduce otherwise high start-up current drains on the electrical supply system. This enables the unit to operate off of a standard household voltage, e.g. 110-120 volt, moderately fused electrical supply system. After start-up, initial compression can be effected with a high motor speed. Once higher pressures have been established in the motor vehicle fuel reservoir or other delivery receptacle, the motor speed is reduced in order to moderate ring wear and limit power consumption. This procedure is especially suited to oil-less compressors as the wear rate of the sealing rings within the compressor cylinders of such units increases when the compressor system is operated at high speed against a high-back pressure.

line that diverts recirculating gas from passing through said dessicant bed and condenser so that, during regeneration, the flow of recirculating gas passing through the condenser is limited, permitting such gas flow to be chilled when it exits the condenser whereby the transfer of moisture from the desiccant bed to the condenser is effected.

9. A compressor system as in claim 5 comprising motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry being connected to said motor through wiring that is shielded by said casing whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

10. A compressor system for gas comprising:

1) a compressor having at least a first stage inlet for receiving a flow of gas from a gas supply inlet to be compressed;

2) a variable speed, alternating current induction motor connected to drive said compressor;

3) a gas delivery outlet at the outlet of the compressor, for supplying gas to a delivery line;

4) a sealed metal casing enclosing the motor, and

5) motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry providing an alternating current of varying frequency to vary the speed of said motor and being

connected to said motor through wiring that is shielded by said casing,
whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

11. A compressor system as in claim 10 wherein said interior volume is connected to said gas supply inlet and to the first stage compressor inlet permitting the compressor to draw gas from the interior volume.

12. A compressor system as in claim 10 wherein the motor control circuitry operates to create an alternating current having multiple harmonics.